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Suicide Among Children, Adolescents, and Young Adults — United States, 1980–1992

Suicide was the fifth leading cause of years of potential life lost before age 65 years in 1990 (CDC, unpublished data, 1995). During 1980–1992, a total of 67,369 persons aged <25 years (i.e., children, adolescents, and young adults) committed suicide and, in 1992, persons in this age group accounted for 16.4% of all suicides. From 1952 through 1992, the incidence of suicide among adolescents and young adults nearly tripled (*1*). One of the national health objectives for the year 2000 is to reduce the suicide rate for persons aged 15–19 years by >25% to 8.2 per 100,000 persons (objective 7.2a) (*2*). This report summarizes trends in suicide among persons aged <25 years from 1980 through 1992 (the latest year for which complete data are available).

Trends in suicide among young persons were determined using final mortality data from CDC's underlying cause of death files (*3*). Suicides and methods of fatal injury were determined by using *International Classification of Diseases, Ninth Revision,* codes. Suicide rates were calculated using population data from the 1980 and 1990 census enumerations and intercensal year estimates compiled by the U.S. Bureau of the Census.

From 1980 to 1992, the number and rate of suicides declined among persons aged <25 years from 5381 (5.7 per 100,000 persons) to 5007 (5.4). For persons aged 20–24 years, the suicide rate declined 7.2% (from 16.1 to 14.9). In comparison, the rate increased among persons aged 15–19 years by 28.3% (from 8.5 to 10.9) and among persons aged 10–14 years by 120% (from 0.8 to 1.7). For persons aged 20–24 years, suicide rates declined for all racial and sex groups except black males (Table 1).* For persons aged 15–19 years, the suicide rate increased for all groups except males of other races; in particular, for black males the rate increased 165.3%. For persons aged 10–14 years, suicide rates increased substantially in all racial and sex groups.

In 1992, firearm-related deaths accounted for 64.9% of suicides among persons aged <25 years. Among persons aged 15–19 years, firearm-related suicides accounted for 81% of the increase in the overall rate from 1980–1992. During 1980–1992, among persons aged <25 years, the proportions of suicides by poisoning, cutting, and other

*Because data for racial groups other than black and white were too small for separate analysis, data for these groups were combined. Data on ethnicity were not analyzed because they were not available for the entire study period.

Suicide — Continued

TABLE 1. Rate* of suicide for persons aged 10–24 years, by age group, and percentage change from 1980 to 1992 — United States

Race/Age group (yrs)	Male			Female		
	1980 Rate	1992 Rate	% Change, 1980 to 1992	1980 Rate	1992 Rate	% Change, 1980 to 1992
White						
10–14	1.4	2.6	+86%	0.3	1.1	+233%
15–19	15.1	18.4	+22%	3.3	3.7	+ 12%
20–24	27.7	26.6	– 4%	5.9	4.0	– 32%
Black						
10–14	0.5	2.0	+300%	0.2	0.4	+100%
15–19	5.6	14.8	+164%	1.6	1.9	+ 19%
20–24	19.9	21.2	+ 7%	3.1	2.4	– 23%
Other†						
10–14	0.0	1.1	Undefined§	0.0	0.2	Undefined
15–19	18.6	17.5	– 6%	3.0	5.0	+ 67%
20–24	24.2	21.1	–13%	6.3	6.2	– 2%
Total	**14.5**	**15.4**	**6%**	**3.1**	**2.8**	**– 10%**

*Per 100,000 persons.
†Because data for racial groups other than black and white were too small for separate analysis, data for these groups were combined. Data on ethnicity were not analyzed because they were not available for the entire study period
§No suicides were reported among persons in these groups in 1980.

methods declined, while the proportions by firearms and hanging increased; hanging was the second most common method of suicide, followed by poisoning.

Reported by: Div of Violence Prevention, National Center for Injury Prevention and Control, CDC.

Editorial Note: The findings in this report are consistent with previous reports indicating that the risk for suicide is greatest among young white males (*4*). However, from 1980 through 1992, suicide rates increased most rapidly among young black males. Although suicide among children is a rare event, the dramatic increase in the suicide rate among persons aged 10–14 years underscores the urgent need for intensifying efforts to prevent suicide among persons in this age group.

The causes of suicide are multiple and complex. Potential reasons for the increase in suicides among some groups may reflect increasing interaction of risk factors including substance abuse; mental illness; impulsive, aggressive, and antisocial behavior; family influences, including a history of violence and family disruption; severe stress in school or social life; and rapid sociocultural change (*5*). The increase in firearm-related suicide probably reflects increased access to firearms by the at-risk population (*6*).

Most youth suicide-prevention programs are directed toward older adolescents and do not include outreach efforts for minorities (*6*). The recent increases in suicide rates among young black males and children aged 10–14 years especially indicate the need to develop interventions for these groups. In addition, the increasing use of firearms for suicide underscores the need for intensifying the development and assessment of suicide-prevention measures directed toward firearms. Because a previous report suggested that suicide attempts among younger persons have not

Suicide — Continued

increased (*7*), the increased rate of completed suicides may be attributed to the use of more lethal means during attempts.

Because attempted suicide is a major risk factor for subsequent suicide, in several states public health surveillance projects have been initiated to improve the quality of information about persons who are at risk for suicide (*8*). In addition, some health departments have initiated comprehensive youth suicide-prevention activities to improve service to the at-risk population (*9*).

Based on review of programs throughout the United States, CDC has identified strategies for preventing suicide among young persons (*6*). These strategies include 1) training school and community leaders to identify young persons at highest risk for suicidal thoughts, threats, and attempts; 2) educating young persons about suicide, risk factors, and interventions; 3) implementing screening and referral programs; 4) developing peer-support programs; 5) establishing and operating suicide crisis centers and hotlines; 6) restricting access to highly lethal methods of suicide; and 7) intervening after a suicide to prevent other young persons from attempting or completing suicide. Rigorous evaluation of new and existing prevention programs is essential to identify and establish the most effective interventions for reducing suicide among young persons.

National Suicide Prevention Week is May 7–13, 1995. This year's theme is "Stop the whispers...suicidal persons can be helped." For additional information, contact the American Association of Suicidology, telephone (202) 237-2280.

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Update: Influenza Activity — United States and Worldwide, 1994–95 Season, and Composition of the 1995–96 Influenza Vaccine

In collaboration with the World Health Organization (WHO) and the international network of collaborating laboratories and with state and local health departments in the United States, CDC conducts surveillance to monitor influenza activity and to detect antigenic changes in the circulating strains of influenza viruses. This report summarizes surveillance for influenza in the United States and worldwide during the 1994–95 season and describes the composition of the 1995–96 influenza vaccine.

United States

Influenza activity began in the Northeast in late November 1994 and from late January to early February spread to other regions of the country. Activity peaked during March and continues to decline.

From November 27, 1994, through January 14, 1995, regional or widespread influenza activity* was reported only from northeastern states. Regional activity was first reported outside this area for the week ending January 21, and by February 11 regional or widespread activity had been reported from every region in the country. Based on reports from state and territorial epidemiologists, peak activity occurred the week ending March 11, 1995, when 26 states reported either regional or widespread activity. The number of states reporting regional or widespread activity has declined every week since March 12. For the week ending April 8, four states reported regional activity, and none reported widespread activity.

Of total deaths reported through CDC's 121-city mortality surveillance system, the proportion attributed to pneumonia and influenza exceeded the epidemic threshold† for 11 of the 27 weeks from October 2, 1994, through April 8, 1995. Pneumonia and influenza deaths exceeded the epidemic threshold for 2 consecutive weeks twice during this interval.

Of the 3423 influenza virus isolates reported to CDC from WHO collaborating laboratories in the United States through April 8, a total of 2654 (78%) were type A and 769 (22%) were type B. Of the 1337 type A viruses that have been subtyped, 1318 (99%) were type A(H3N2) and 19 (1%) were type A(H1N1).

Worldwide

Influenza activity has occurred at low to moderate levels in most parts of the world. Although a few countries reported epidemic activity, sporadic activity or localized outbreaks were reported more frequently. Influenza activity was usually associated with cocirculation of influenza A(H3N2) and influenza B viruses. Influenza A(H1N1) activity was reported only in association with sporadic cases. Influenza A(H3N2) viruses were first detected during October in Europe and North America. Outbreaks associated with

*Levels of activity are 1) *sporadic*—sporadically occurring influenza-like illness (ILI) or culture-confirmed influenza, with no outbreaks detected; 2) *regional*—outbreaks of ILI or culture-confirmed influenza in counties having a combined population of <50% of the state's total population; and 3) *widespread*—outbreaks of ILI or culture-confirmed influenza in counties having a combined population of ≥50% of the state's total population.

†The epidemic threshold is 1.645 standard deviations above the seasonal baseline. The expected seasonal baseline is projected using a robust regression procedure in which a periodic regression model is applied to observed percentages of deaths from pneumonia and influenza since 1983.

Influenza Activity — Continued

influenza A(H3N2) were subsequently reported in the People's Republic of China, Finland, Hungary, Italy, Spain, the United Kingdom, and the United States. Although influenza A and influenza B cocirculated, influenza A(H3N2) viruses predominated in Canada, Finland, France, Italy, Spain, and the United States.

Influenza type B viruses were first detected this season in Europe in association with a secondary school outbreak in Portugal during October. Outbreaks caused by influenza B were reported subsequently in China, Iran, Italy, and the United States. Epidemic activity associated with influenza B was reported in Italy and Russia. In Germany, the Netherlands, Portugal, Russia, and the United Kingdom, influenza B viruses were isolated more frequently than influenza A(H3N2) viruses.

Influenza A(H1N1) viruses have been reported in association with sporadic activity from Canada, China, Hong Kong, the Netherlands, Norway, Poland, Singapore, Switzerland, Thailand, the United Kingdom, and the United States during the 1994–95 season.

Composition of the 1995–96 Vaccine

The Food and Drug Administration Vaccines and Related Biologicals Advisory Committee (VRBAC) has recommended that the 1995–96 trivalent influenza vaccine for the United States contain A/Johannesburg/33/94-like (H3N2), A/Texas/36/91-like (H1N1) and B/Beijing/184/93-like viruses. This recommendation was based on the antigenic analysis of recently isolated influenza viruses and the antibody responses of persons vaccinated with the 1994–95 vaccine.

Although many of the influenza type A(H3N2) viruses that have been antigenically characterized are similar to the A/Shangdong/09/93 strain, some recently isolated A(H3N2) strains from Asia, Europe, and North America are more similar to the antigenic variant A/Johannesburg/33/94 (Table 1). Vaccines containing the A/Shangdong/09/93(H3N2)-like virus induced a good antibody response to the vaccine strain but induced lower and less frequent antibody responses to recent type A(H3N2) strains such as A/Johannesburg/33/94 (*1*). Therefore, VRBAC recommended changing the influenza type A(H3N2) vaccine component to an A/Johannesburg/33/94-like strain for the 1995–96 season.

TABLE 1. Hemagglutination-inhibition titers of influenza A(H3N2) viruses with serum specimens from infected ferrets*

	Ferret antiserum		
Viral antigen	A/Shangdong/09/93	A/Quangdong/25/93	A/Johannesburg/33/94
Reference antigen			
A/Shangdong/09/93	**640**	320	160
A/Guangdong/25/93	320	**1280**	1280
A/Johannesburg/33/94	160	1280	**1280**
Recent isolates			
A/Alaska/06/95	160	1280	640
A/Washington/02/95	160	640	640
A/Korea/10/95	160	640	1280
A/Netherlands/01/95	160	640	640
A/Canada/20/95	160	640	640

*A fourfold difference in hemagglutination-inhibition titers with two viruses is usually indicative of antigenic variation between viruses.

Influenza Activity — Continued

Many recent influenza B viruses isolated from Asia, Europe, and North America are antigenically distinguishable from the B/Panama/45/90 strain included in the 1994–95 vaccine. These recent viruses are similar to the B/Beijing/184/93, B/Shanghai/04/94, and B/Harbin/07/94 strains. These strains, which are themselves antigenically indistinguishable, have been used as reference strains for antigenic analysis (Table 2). Although vaccines containing B/Panama/45/90 virus induced antibodies at a similar frequency and titer as the vaccine virus for some recent influenza B strains, in some studies the antibody response in adults and the elderly was reduced to the B/Beijing/184/93-like strain, B/Shanghai/04/94. VRBAC recommended changing the influenza B component to a B/Beijing/184/93-like virus for the 1995–96 season. The actual strain used by U.S. vaccine manufacturers will be B/Harbin/07/94 because of its growth properties.

Since the 1992–93 influenza season, isolation of influenza type A(H1N1) virus has been sporadic worldwide (*2*). Nine recent viruses from China and the United States have been characterized as being related to the reference strains A/Taiwan/01/86 and A/Texas/36/91. Vaccines containing the A/Texas/36/91 strain induced antibodies with similar frequency and titer to the vaccine virus and to type A(H1N1) strains isolated in 1993 and 1994. Therefore, VRBAC recommended retaining an A/Texas/36/91-like strain in the 1995–96 vaccine.

Reported by: Participating state and territorial health dept epidemiologists and state public health laboratory directors. M Chakraverty, PhD, Central Public Health Laboratory, A Hay, PhD, National Institute for Medical Research, London; G Schild, PhD, J Wood, PhD, National Institute for Biological Standards and Control, Hertfordshire, England. I Gust, MD, A Hampson, Commonwealth Serum Laboratories, Parkville, Australia. J Weber, Laboratory Center for Disease Control, Ottawa, Ontario. J Kim, PhD, K Park, PhD, National Institute of Health, Seoul, Korea. E Claas, PhD, Eramus University, Rotterdam, The Netherlands. World Health Organization National Influenza Centers, Program on Bacterial, Viral Diseases, and Immunology, Geneva. Div of Virology, Center for Biologics Evaluation and Research, Food and Drug Administration. Influenza Br, Div of Viral and Rickettsial Diseases, National Center for Infectious Diseases, CDC.

Editorial Note: During the 1994–95 season, the impact of influenza in most parts of the United States and in most other countries in the Northern Hemisphere was less severe than during the previous season, when A/Beijing/32/92-like (H3N2) viruses

TABLE 2. Hemagglutination-inhibition titers of influenza B viruses with serum specimens from infected ferrets*

	Ferret antiserum			
Viral antigen	**B/Panama/ 45/90**	**B/Beijing/ 184/93**	**B/Shanghai/ 04/94**	**B/Harbin/ 07/94**
Reference antigen				
B/Panama/45/90	**640**	320	320	320
B/Beijing/184/93	160	**320**	320	320
B/Shanghai/04/94	160	320	**320**	640
B/Harbin/07/94	160	320	320	**640**
Recent isolates				
B/Pennsylvania/05/95	160	320	320	640
B/Iowa/01/95	80	320	160	320
B/England/73/94	160	320	320	640
B/Canada/01/95	160	640	320	320

*A fourfold difference in hemagglutination-inhibition titers with two viruses is usually indicative of antigenic variation between viruses.

Influenza Activity — Continued

predominated. Although approximately 75% of influenza viruses circulating in the United States during the 1994–95 season have been type A(H3N2), compared with the 1993–94 season, influenza spread more slowly and was associated with less severe illness. The results of mortality surveillance based on the 121-city system suggest relatively low influenza-associated mortality in the United States this season and are consistent with other influenza surveillance findings.

Strains to be included in next season's influenza vaccine are selected usually during the preceding January through March because of scheduling requirements for production, quality control, packaging, and distribution of vaccine for administration before onset of the next influenza season. Recommendations of the Advisory Committee on Immunization Practices for the use of vaccine and antiviral agents for prevention and control of influenza have been published in the *MMWR Recommendations and Reports* (*3*).

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Local Transmission of *Plasmodium vivax* Malaria — Houston, Texas, 1994

Malaria was endemic in the United States until the late 1940s; since then, most cases of malaria reported in the United States has been acquired during international travel or has occurred in persons who had resided in countries where malaria is endemic. This report summarizes the investigation of three persons who acquired *Plasmodium vivax* infection in Houston, Texas, by presumed mosquitoborne transmission during 1994.

Case Reports

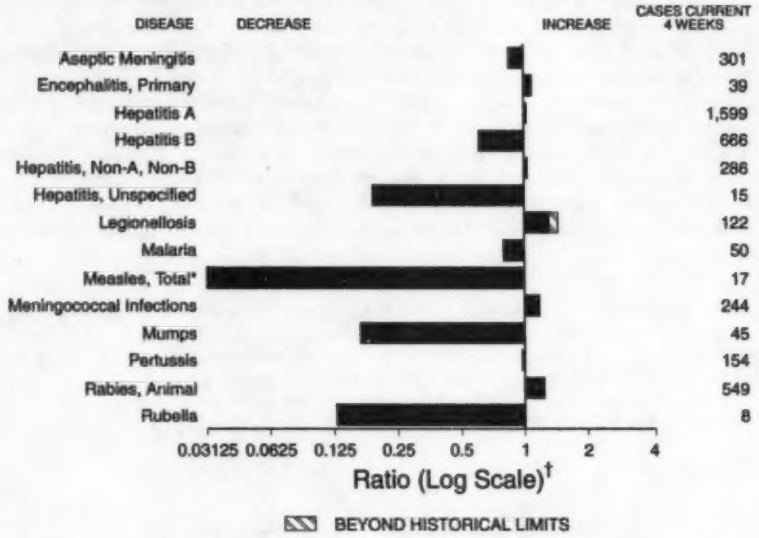
Case 1. On July 8, a 62-year-old man was hospitalized with an 8-day history of fever chills, sweats, and vomiting. His temperature on admission was 104.0 F (40.0 C). *P. vivax* parasites were identified on a blood smear on July 11. The patient recovered after treatment with chloroquine and primaquine.

Case 2. On July 18, a 37-year-old man sought care in an emergency department at another hospital because of a temperature of 102.8 F (39.3 C) and a 3-week history of nausea, vomiting, fever, chills, sweats, headache, and shortness of breath. *P. vivax* parasites were identified on a routine peripheral blood smear on July 18. He recovered after treatment with chloroquine; although primaquine was not initially prescribed, he received it during the investigation in August.

Case 3. On December 4, a 50-year-old man was admitted to the same hospital as in case 2 because of altered mental status, fever, and headache of 2 weeks' duration; his temperature on admission was 100.0 F (37.8 C). *P. vivax* parasites were identified on a routine peripheral blood smear on December 6. He recovered after treatment with

(Continued on page 301)

FIGURE I. Notifiable disease reports, comparison of 4-week totals ending April 15, 1995, with historical data — United States



*The large apparent decrease in the number of reported cases of measles (total) reflects dramatic fluctuations in the historical baseline.
†Ratio of current 4-week total to mean of 15 4-week totals (from previous, comparable, and subsequent 4-week periods for the past 5 years). The point where the hatched area begins is based on the mean and two standard deviations of these 4-week totals.

TABLE I. Summary — cases of specified notifiable diseases, United States, cumulative, week ending April 15, 1995 (15th Week)

	Cum. 1995		Cum. 1995
Anthrax	-	Plague	-
Aseptic Meningitis	1,222	Poliomyelitis, Paralytic	-
Brucellosis	14	Psittacosis	11
Cholera	-	Rabies, human	1
Congenital rubella syndrome	3	Rocky Mountain Spotted Fever	33
Diphtheria	-	Syphilis, congenital, age < 1 year†	-
Encephalitis, primary	138	Tetanus	7
Encephalitis, post-infectious	28	Toxic shock syndrome	57
*Haemophilus influenzae**	401	Trichinosis	9
Hansen Disease	30	Tularemia	6
Hepatitis, unspecified	106	Typhoid fever	77
Leptospirosis	13		

*Of 387 cases of known age, 91 (24%) were reported among children less than 5 years of age.
†Updated quarterly from reports to the Division of Sexually Transmitted Diseases and HIV Prevention, National Center for Prevention Services. First quarter data not yet available.
-: no reported cases

TABLE II. Cases of selected notifiable diseases, United States, weeks ending April 15, 1995, and April 16, 1994 (15th Week)

Reporting Area	AIDS*	Gonorrhea		Hepatitis (Viral), by type						Legionellosis	
				A		B		NA,NB			
	Cum. 1995	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994
UNITED STATES	19,662	102,741	108,962	6,445	6,122	2,262	3,454	939	1,234	363	419
NEW ENGLAND	842	1,666	2,340	45	90	50	130	28	42	5	5
Maine	23	18	16	9	11	2	4	-	-	-	-
N.H.	38	32	21	2	3	6	6	3	5	-	-
Vt.	7	14	8	-	-	1	4	-	5	-	-
Mass.	457	897	859	19	41	15	91	24	25	4	1
R.I.	59	166	125	8	12	7	3	1	7	1	4
Conn.	258	539	1,311	7	23	19	22	-	-	N	N
MID. ATLANTIC	4,550	10,624	12,465	337	438	254	410	101	152	40	50
Upstate N.Y.	521	1,851	2,386	96	129	98	108	52	69	11	11
N.Y. City	2,342	3,524	5,118	153	170	57	87	1	1	-	1
N.J.	1,112	1,196	1,490	45	92	53	112	37	70	6	10
Pa.	575	4,053	3,471	43	45	46	103	11	12	23	28
E.N. CENTRAL	1,622	22,591	19,588	870	577	255	410	84	114	94	156
Ohio	409	7,122	6,907	557	157	30	57	4	3	46	56
Ind.	106	2,219	2,236	46	105	67	69	-	3	21	51
Ill.	737	6,334	3,710	116	185	35	102	12	34	7	9
Mich.	278	5,628	4,780	111	74	115	104	48	74	14	27
Wis.	92	1,288	1,935	40	56	8	78	-	-	6	11
W.N. CENTRAL	427	5,506	6,271	301	282	156	186	28	20	41	29
Minn.	93	881	948	33	52	11	15	1	4	-	-
Iowa	20	437	390	16	8	12	10	3	4	8	20
Mo.	148	3,296	3,453	202	143	111	141	18	4	26	4
N. Dak.	1	6	9	7	1	1	-	-	-	3	2
S. Dak.	1	49	57	6	10	1	-	1	-	-	-
Nebr.	43	-	332	9	36	7	8	2	3	2	2
Kans.	121	837	1,082	28	32	13	12	3	5	2	1
S. ATLANTIC	5,708	31,629	28,849	319	360	384	758	89	241	52	96
Del.	113	598	518	5	8	2	3	1	1	-	-
Md.	978	4,020	5,463	61	55	63	109	3	12	12	22
D.C.	373	1,494	1,877	2	6	8	13	-	-	3	-
Va.	374	3,271	3,751	56	38	27	28	1	14	3	2
W. Va.	21	193	203	9	3	20	7	19	9	3	1
N.C.	248	7,180	7,096	35	29	96	86	21	22	9	7
S.C.	280	3,235	3,529	9	9	10	12	1	1	9	1
Ga.	594	5,362	U	37	21	34	350	10	145	7	45
Fla.	2,727	6,278	6,412	105	189	104	150	33	37	6	18
E.S. CENTRAL	612	13,384	9,747	126	129	139	364	168	248	7	21
Ky.	63	2,730	1,272	12	68	14	38	6	6	1	3
Tenn.	289	1,843	3,695	52	44	88	306	161	240	3	13
Ala.	159	6,043	4,780	41	17	39	22	1	2	2	5
Miss.	121	2,768	U	21	U	-	U	-	U	1	U
W.S. CENTRAL	1,404	9,202	12,117	661	764	311	316	134	96	3	11
Ark.	64	999	1,986	37	29	4	9	-	2	-	4
La.	299	3,468	3,811	19	27	26	34	26	20	1	-
Okla.	84	564	976	132	62	109	104	102	52	2	7
Tex.	957	4,171	5,344	473	646	172	169	6	22	-	-
MOUNTAIN	637	2,350	7,009	1,280	1,179	204	162	142	118	75	27
Mont.	8	28	29	19	9	7	6	7	1	2	9
Idaho	17	39	23	136	95	23	25	13	35	1	-
Wyo.	4	17	28	50	6	3	6	60	31	1	1
Colo.	214	897	974	168	142	40	32	26	21	23	4
N. Mex.	69	276	298	246	303	69	52	18	14	2	1
Ariz.	133	842	5,148	308	451	33	18	10	4	36	1
Utah	37	39	101	315	113	21	10	3	8	2	1
Nev.	155	212	498	38	60	8	13	5	4	8	10
PACIFIC	3,850	5,789	10,506	2,506	2,305	529	718	185	203	46	24
Wash.	360	748	887	164	345	47	73	62	72	1	5
Oreg.	122	18	289	478	109	29	19	10	2	-	-
Calif.	3,261	4,586	8,858	1,800	1,771	446	601	104	126	40	17
Alaska	29	251	238	15	68	2	5	1	-	-	-
Hawaii	78	186	234	51	12	5	20	8	3	5	2
Guam	-	23	44	1	3	-	-	-	-	-	2
P.R.	649	148	154	15	23	207	92	184	32	-	-
V.I.	14	3	8	-	-	1	1	-	-	-	-
Amer. Samoa	-	8	7	5	4	-	-	-	-	-	-
C.N.M.I.	-	3	17	1	2	-	-	-	-	-	-

N: Not notifiable U: Unavailable -: no reported cases C.N.M.I.: Commonwealth of Northern Mariana Islands

*Updated monthly to the Division of HIV/AIDS, National Center for Infectious Diseases; last update March 30, 1995.

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending April 15, 1995, and April 16, 1994 (15th Week)

Reporting Area	Lyme Disease		Malaria		Measles (Rubeola)						Meningococcal Infections		Mumps	
					Indigenous		Imported*		Total					
	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	1995	Cum. 1995	1995	Cum. 1995	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994
UNITED STATES	1,018	1,098	241	302	-	156	-	3	161	241	985	987	221	406
NEW ENGLAND	47	119	14	25	-	2	-	1	3	9	62	51	3	10
Maine	1	-	1	1	-	-	-	-	-	-	3	7	2	3
N.H.	5	6	1	3	-	-	-	-	-	-	13	1	-	4
Vt.	1	1	-	1	-	-	-	-	-	-	6	1	-	-
Mass.	30	22	3	8	-	-	-	1	1	1	22	19	-	-
R.I.	10	16	2	4	-	2	-	-	2	5	-	-	-	1
Conn.	-	74	7	8	-	-	-	-	-	3	18	23	1	2
MID. ATLANTIC	780	777	52	45	-	2	-	-	2	106	97	82	30	40
Upstate N.Y.	463	619	11	14	-	-	-	-	-	4	40	33	9	6
N.Y. City	3	10	22	10	-	1	-	-	1	1	10	3	4	-
N.J.	47	95	12	13	-	-	-	-	-	100	21	23	-	8
Pa.	267	53	7	8	-	1	-	-	1	1	26	23	17	26
E.N. CENTRAL	18	10	19	35	-	-	-	-	-	18	124	153	32	106
Ohio	13	4	1	5	-	-	-	-	-	10	39	36	15	8
Ind.	2	1	2	9	-	-	-	-	-	1	21	33	1	4
Ill.	-	4	14	11	-	-	-	-	-	1	36	49	5	72
Mich.	1	1	2	9	-	-	-	-	-	3	24	14	11	19
Wis.	-	-	-	1	-	-	-	-	-	3	4	21	-	3
W.N. CENTRAL	18	18	7	17	-	-	-	-	-	2	59	67	13	18
Minn.	-	4	3	4	-	-	-	-	-	-	11	5	2	-
Iowa	1	1	-	3	-	-	-	-	-	-	9	5	3	4
Mo.	4	10	3	7	-	-	-	-	-	1	22	36	6	10
N. Dak.	-	-	-	-	-	-	-	-	-	-	-	-	-	1
S. Dak.	-	-	-	-	-	-	-	-	-	-	2	5	-	-
Nebr.	-	-	1	2	-	-	-	-	-	1	6	4	2	1
Kans.	13	3	-	1	-	-	-	-	-	-	9	10	-	-
S. ATLANTIC	114	135	59	69	-	-	-	-	-	4	181	157	33	66
Del.	7	11	1	2	-	-	-	-	-	-	2	2	-	-
Md.	80	53	18	29	-	-	-	-	-	-	9	11	-	16
D.C.	-	1	4	7	-	-	-	-	-	-	1	1	-	-
Va.	3	12	10	8	-	-	-	-	-	1	24	23	9	16
W. Va.	7	3	-	-	-	-	-	-	-	-	3	7	-	3
N.C.	8	19	5	2	-	-	-	-	-	-	28	30	16	19
S.C.	4	-	-	2	-	-	-	-	-	-	25	5	3	5
Ga.	4	34	10	10	-	-	-	-	-	-	47	28	-	3
Fla.	1	2	11	9	-	-	-	-	-	3	42	50	5	4
E.S. CENTRAL	4	8	3	6	-	-	-	-	-	27	59	62	11	-
Ky.	1	6	-	2	-	-	-	-	-	-	20	15	-	-
Tenn.	1	1	-	3	-	-	-	-	-	27	12	18	4	-
Ala.	-	1	3	1	-	-	-	-	-	-	15	29	3	-
Miss.	2	U	-	U	-	-	-	-	-	U	12	U	4	U
W.S. CENTRAL	19	7	6	7	-	2	-	-	2	7	118	120	9	78
Ark.	-	-	2	-	-	2	-	-	2	-	10	18	-	-
La.	-	-	1	-	-	-	-	-	-	1	14	18	2	7
Okla.	11	6	-	2	-	-	-	-	-	-	11	9	-	21
Tex.	8	1	3	5	-	-	-	-	-	6	83	75	7	50
MOUNTAIN	2	4	19	11	-	40	-	-	40	60	80	78	15	8
Mont.	-	-	2	-	-	-	-	-	-	-	2	2	-	-
Idaho	-	1	1	2	-	1	-	-	1	-	2	11	3	3
Wyo.	-	-	-	-	-	-	-	-	-	-	4	2	-	-
Colo.	1	-	9	4	-	-	-	-	-	9	19	9	1	-
N. Mex.	-	3	3	2	-	28	-	-	28	-	18	6	N	N
Ariz.	-	-	2	-	-	10	-	-	10	-	28	29	3	-
Utah	-	-	1	3	-	-	-	-	-	51	2	13	1	2
Nev.	1	-	1	-	-	1	-	-	1	-	5	4	6	3
PACIFIC	16	20	82	87	-	112	-	2	114	8	205	219	75	82
Wash.	-	-	7	6	-	13	-	1	14	-	34	38	4	6
Oreg.	1	-	4	6	-	1	-	-	1	-	38	46	N	N
Calif.	17	20	44	67	-	98	-	-	98	8	130	129	62	68
Alaska	-	-	1	-	-	-	-	-	-	-	1	1	8	2
Hawaii	-	-	6	8	-	-	-	1	1	-	2	5	1	6
Guam	-	-	-	-	U	-	U	-	-	18	1	-	2	2
P.R.	-	-	-	-	-	3	-	-	3	22	10	5	-	2
V.I.	-	-	-	-	U	-	U	-	-	-	-	-	1	-
Amer. Samoa	-	-	-	-	U	-	U	-	-	-	-	-	-	1
C.N.M.I.	-	-	-	1	U	-	U	-	-	26	-	-	-	-

*For imported measles, cases include only those resulting from importation from other countries.
N: Not notifiable U: Unavailable -: no reported cases

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending April 15, 1995, and April 16, 1994 (15th Week)

Reporting Area	Pertussis			Rubella			Syphilis (Primary & Secondary)		Tuberculosis		Rabies, Animal	
	1995	Cum. 1995	Cum. 1994	1995	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994
UNITED STATES	37	853	1,048	5	25	121	4,498	5,459	4,120	5,120	1,794	1,991
NEW ENGLAND	3	94	101	-	2	83	60	60	91	96	510	532
Maine	-	11	2	-	-	-	2	1	-	-	-	-
N.H.	1	6	28	-	1	-	1	1	3	2	64	67
Vt.	-	2	10	-	-	-	-	-	1	-	70	51
Mass.	2	71	57	-	1	83	20	17	45	47	208	202
R.I.	-	-	2	-	-	-	1	5	11	11	71	5
Conn.	-	4	4	-	-	-	36	36	31	35	97	207
MID. ATLANTIC	5	60	210	-	2	4	279	395	899	863	467	466
Upstate N.Y.	4	38	81	-	1	4	20	46	77	137	196	323
N.Y. City	-	10	34	-	1	-	154	218	497	490	-	-
N.J.	-	-	8	-	-	-	57	60	162	159	91	96
Pa.	1	12	87	-	-	-	48	71	163	77	180	47
E.N. CENTRAL	1	71	254	-	-	11	818	707	470	506	2	7
Ohio	1	33	58	-	-	-	271	294	83	69	1	-
Ind.	-	4	30	-	-	-	73	77	10	52	-	-
Ill.	-	4	86	-	-	6	339	152	261	273	1	3
Mich.	-	29	19	-	-	5	92	96	105	103	-	2
Wis.	-	1	61	-	-	-	43	88	11	10	-	2
W.N. CENTRAL	9	36	28	-	-	-	228	389	152	103	73	47
Minn.	9	14	8	-	-	-	15	14	31	23	2	1
Iowa	-	1	2	-	-	-	19	15	22	9	28	19
Mo.	-	-	10	-	-	-	185	331	56	50	12	6
N. Dak.	-	5	1	-	-	-	-	-	1	1	7	-
S. Dak.	-	6	-	-	-	-	-	-	8	6	11	6
Nebr.	-	3	1	-	-	-	-	4	6	1	-	-
Kans.	-	7	6	-	-	-	9	25	28	13	13	15
S. ATLANTIC	5	78	122	3	4	5	1,066	1,862	764	996	532	555
Del.	1	5	-	-	-	-	7	6	-	7	10	9
Md.	-	-	41	-	-	-	24	77	127	90	123	177
D.C.	-	1	3	-	-	-	42	71	23	37	2	2
Va.	-	7	13	-	-	-	206	210	29	104	107	118
W. Va.	-	-	2	-	-	-	1	6	29	24	28	21
N.C.	-	49	34	-	-	-	330	555	72	98	125	56
S.C.	2	10	8	-	-	-	186	200	86	115	45	54
Ga.	-	1	6	-	-	-	137	262	117	189	81	113
Fla.	2	5	15	3	4	5	133	275	281	332	13	5
E.S. CENTRAL	-	16	34	-	2	-	1,166	567	234	311	58	59
Ky.	-	-	15	-	-	-	79	78	54	88	5	3
Tenn.	-	1	13	-	2	-	162	281	-	111	11	28
Ala.	-	15	6	-	-	-	190	208	115	112	42	28
Miss.	-	-	U	-	-	U	735	U	65	U	-	U
W.S. CENTRAL	3	29	26	-	1	4	702	1,194	491	487	32	211
Ark.	-	-	-	-	-	-	176	147	49	72	9	11
La.	-	1	3	-	-	-	330	567	-	-	9	30
Okla.	1	3	20	-	-	4	21	49	1	58	14	15
Tex.	2	25	3	-	1	-	175	431	441	357	-	155
MOUNTAIN	8	300	80	1	3	-	78	188	182	128	24	31
Mont.	-	3	2	-	-	-	3	-	3	-	12	4
Idaho	2	29	19	-	-	-	-	1	7	4	-	-
Wyo.	-	-	-	-	-	-	2	-	1	1	2	5
Colo.	-	1	42	-	-	-	50	54	4	9	-	-
N. Mex.	1	10	5	-	-	-	1	5	22	26	-	-
Ariz.	4	252	8	1	3	-	11	107	80	57	9	21
Utah	-	2	4	-	-	-	4	5	10	-	-	-
Nev.	1	3	-	-	-	-	7	14	55	31	1	1
PACIFIC	3	189	191	1	11	14	101	299	837	1,631	96	83
Wash.	-	22	27	1	1	-	5	10	64	64	-	-
Oreg.	2	5	21	-	1	-	-	2	3	35	-	-
Calif.	-	137	139	-	8	13	96	285	707	1,442	93	63
Alaska	-	-	-	-	-	-	-	1	18	23	3	20
Hawaii	1	5	4	-	1	1	-	1	47	67	-	-
Guam	U	-	-	U	-	1	1	1	4	7	-	-
P.R.	-	4	3	-	-	-	86	105	23	29	13	23
V.I.	U	-	-	U	-	-	-	9	-	-	-	-
Amer. Samoa	U	-	1	U	-	-	-	-	2	-	-	-
C.N.M.I.	U	-	-	U	-	-	-	1	2	14	-	-

U: Unavailable -: no reported cases

TABLE III. Deaths in 121 U.S. cities,* week ending April 15, 1995 (15th Week)

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	586	417	86	45	20	18	38
Boston, Mass.	161	99	35	10	4	13	6
Bridgeport, Conn.	35	28	4	3	-	-	4
Cambridge, Mass.	11	6	3	1	1	-	2
Fall River, Mass.	42	35	5	2	-	-	2
Hartford, Conn.	40	28	3	7	1	1	-
Lowell, Mass.	19	8	4	5	2	-	1
Lynn, Mass.	17	11	3	3	-	-	-
New Bedford, Mass.	26	20	4	1	1	-	2
New Haven, Conn.	40	33	3	-	3	1	4
Providence, R.I.	52	41	8	2	-	1	6
Somerville, Mass.	4	3	-	1	-	-	-
Springfield, Mass.	44	38	3	3	-	-	3
Waterbury, Conn.	32	27	2	2	1	-	-
Worcester, Mass.	63	40	9	5	7	2	8
MID. ATLANTIC	2,175	1,441	417	239	47	31	109
Albany, N.Y.	61	45	12	2	2	-	9
Allentown, Pa.	U	U	U	U	U	U	U
Buffalo, N.Y.	77	64	11	-	1	1	2
Camden, N.J.	26	20	3	1	2	-	2
Elizabeth, N.J.	19	17	1	1	-	-	3
Erie, Pa.§	44	35	7	2	-	-	5
Jersey City, N.J.	37	20	11	4	2	-	-
New York City, N.Y.	1,375	873	272	182	29	19	51
Newark, N.J.	85	40	24	15	5	1	6
Paterson, N.J.	23	16	5	2	-	-	-
Philadelphia, Pa.	U	U	U	U	U	U	U
Pittsburgh, Pa.§	63	51	7	4	1	-	4
Reading, Pa.	13	10	-	2	1	-	-
Rochester, N.Y.	154	108	27	12	2	5	14
Schenectady, N.Y.	35	26	7	-	-	2	2
Scranton, Pa.§	24	18	5	1	-	-	2
Syracuse, N.Y.	91	67	15	6	2	1	8
Trenton, N.J.	26	17	4	3	-	2	2
Utica, N.Y.	22	14	6	2	-	-	1
Yonkers, N.Y.	U	U	U	U	U	U	U
E.N. CENTRAL	2,176	1,361	436	223	123	41	119
Akron, Ohio	72	44	20	7	-	1	-
Canton, Ohio	40	30	5	4	1	-	2
Chicago, Ill.	604	264	141	112	77	10	27
Cincinnati, Ohio	77	58	10	6	2	1	10
Cleveland, Ohio	95	64	22	8	-	1	1
Columbus, Ohio	191	121	42	15	6	7	13
Dayton, Ohio	114	83	21	5	2	3	6
Detroit, Mich.	246	141	62	28	14	3	6
Evansville, Ind.	33	28	4	1	-	-	1
Fort Wayne, Ind.	56	44	9	3	-	-	2
Gary, Ind.	9	4	2	2	-	1	1
Grand Rapids, Mich.	47	35	5	1	4	2	2
Indianapolis, Ind.	153	103	29	10	6	5	17
Madison, Wis.	52	32	11	5	2	2	4
Milwaukee, Wis.	94	70	17	6	-	1	8
Peoria, Ill.	35	24	6	1	4	-	3
Rockford, Ill.	58	48	6	2	-	-	8
South Bend, Ind.	48	37	6	3	1	1	2
Toledo, Ohio	100	77	12	5	4	2	6
Youngstown, Ohio	54	44	8	1	-	1	-
W.N. CENTRAL	886	452	125	47	34	16	47
Des Moines, Iowa	58	46	9	2	1	-	2
Duluth, Minn.	42	34	4	4	-	-	4
Kansas City, Kans.	U	U	U	U	U	U	U
Kansas City, Mo.	117	67	19	10	5	4	8
Lincoln, Nebr.	37	28	9	-	-	-	4
Minneapolis, Minn.	164	87	35	21	20	1	14
Omaha, Nebr.	92	68	13	3	3	5	7
St. Louis, Mo.	115	81	22	4	4	4	3
St. Paul, Minn.	61	41	14	3	1	2	5
Wichita, Kans.	U	U	U	U	U	U	U
S. ATLANTIC	1,334	829	281	171	38	33	78
Atlanta, Ga.	153	88	29	26	1	7	1
Baltimore, Md.	101	64	15	16	3	3	12
Charlotte, N.C.	121	78	20	18	5	-	8
Jacksonville, Fla.	149	96	35	12	4	1	12
Miami, Fla.	113	56	32	19	4	2	-
Norfolk, Va.	51	30	7	8	1	5	2
Richmond, Va.	91	59	19	6	4	3	6
Savannah, Ga.	51	41	4	3	1	2	4
St. Petersburg, Fla.	59	44	7	4	1	3	5
Tampa, Fla.	177	128	29	15	3	2	18
Washington, D.C.	255	140	64	37	9	5	10
Wilmington, Del.	13	5	-	5	-	-	-
E.S. CENTRAL	750	511	146	55	21	13	67
Birmingham, Ala.	143	91	25	11	9	3	6
Chattanooga, Tenn.	49	33	10	3	2	1	7
Knoxville, Tenn.	103	79	16	7	1	-	14
Lexington, Ky.	50	35	10	4	1	-	3
Memphis, Tenn.	166	115	39	8	2	2	24
Mobile, Ala.	55	40	8	4	2	1	4
Montgomery, Ala.	41	28	9	2	1	1	3
Nashville, Tenn.	143	90	29	16	3	5	6
W.S. CENTRAL	1,384	852	298	147	54	30	80
Austin, Tex.	68	36	19	11	2	-	2
Baton Rouge, La.	54	36	14	3	-	1	4
Corpus Christi, Tex.	52	37	10	3	1	1	7
Dallas, Tex.	197	120	44	19	9	5	6
El Paso, Tex.	89	51	22	10	3	3	5
Ft. Worth, Tex.	95	58	19	12	4	2	7
Houston, Tex.	301	178	67	43	10	5	17
Little Rock, Ark.	88	46	12	8	1	3	6
New Orleans, La.	105	49	15	18	14	8	-
San Antonio, Tex.	220	149	47	15	5	4	16
Shreveport, La.	65	48	12	4	1	-	6
Tulsa, Okla.	70	46	17	3	4	-	4
MOUNTAIN	923	635	163	79	28	15	62
Albuquerque, N.M.	96	62	18	13	3	-	6
Colo. Springs, Colo.	53	37	6	6	2	-	7
Denver, Colo.	103	65	19	13	2	4	6
Las Vegas, Nev.	222	156	42	15	5	3	11
Ogden, Utah	28	18	6	3	1	-	2
Phoenix, Ariz.	168	99	41	14	9	3	15
Pueblo, Colo.	25	24	1	-	-	-	3
Salt Lake City, Utah	103	79	14	3	4	3	6
Tucson, Ariz.	125	95	18	10	2	2	6
PACIFIC	1,867	1,283	331	166	64	38	148
Berkeley, Calif.	25	17	5	2	1	-	3
Fresno, Calif.	103	70	18	10	6	1	5
Glendale, Calif.	22	18	3	1	-	-	1
Honolulu, Hawaii	89	48	13	3	1	4	8
Long Beach, Calif.	71	42	13	9	5	2	6
Los Angeles, Calif.	495	331	92	49	13	7	31
Pasadena, Calif.	17	9	5	2	1	-	1
Portland, Oreg.	U	U	U	U	U	U	U
Sacramento, Calif.	191	127	39	17	6	2	20
San Diego, Calif.	160	115	26	8	3	6	16
San Francisco, Calif.	150	76	25	31	16	2	18
San Jose, Calif.	200	146	38	9	3	4	19
Santa Cruz, Calif.	32	20	8	3	1	-	2
Seattle, Wash.	159	113	25	12	2	7	7
Spokane, Wash.	71	55	6	4	5	1	4
Tacoma, Wash.	102	76	17	6	1	2	5
TOTAL	11,881¶	7,751	2,265	1,172	427	235	748

*Mortality data in this table are voluntarily reported from 121 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.
†Pneumonia and influenza.
§Because of changes in reporting methods in these 3 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.
¶Total includes unknown ages.
U: Unavailable -: no reported cases

Malaria — Continued

chloroquine and primaquine. He had had similar symptoms with onset during late July and early August and had been admitted to two different hospitals during August. During the second hospitalization, viral meningitis was presumptively diagnosed; evaluation included one thick blood smear on August 23 (which was reported as negative for malaria parasites), and acute and convalescent immunoglobulin M enzyme-linked immunosorbent assay titers for St. Louis encephalitis (both titers were 1:10). The blood smears from August 23 were unavailable for review. However, tests of serum specimens from the August and December hospitalizations for malaria antibody by an indirect immunofluorescent assay were positive for *P. vivax* (titer of 1:64 on August 23, 1:256 on August 30, and 1:256 on December 6). These results indicate *P. vivax* malaria infection before December, and that the December episode most likely was a relapse from dormant liver stages (hypnozoite), which result only from mosquitoborne inoculation with sporozoites and not from person-to-person transmission (e.g., through blood transfusions or injecting drugs).

Case Investigations

Case-patients 2 and 3 had never traveled outside of the United States; case-patient 1 had traveled outside the United States only before 1956. None had a history of blood transfusions, tattoos, malariotherapy for Lyme disease, recent injecting-drug use, or previous malaria infection. They lived within a 3-mile radius, were not acquainted, and had not been in the same locations. However, all had prolonged nighttime exposure to mosquitoes, either through working outdoors at night or sleeping in housing without window panes and/or with unscreened windows and doors. They lived 10 miles from the nearest international airport, and there are no prevailing winds in Houston that would carry anophelines beyond their maximal flight range of 1–2 miles (*1*).

Active Case-Finding

Medical record reviews at all clinical laboratories and hospitals and contacts with infectious disease physicians identified 21 additional malaria patients in Houston and Harris County during June 1–August 22. At the time of the investigation, four (19%) of these patients had been reported through the existing passive surveillance system; 17 (81%) were identified by contacting laboratories in the Houston area. All 21 had traveled to countries where malaria is endemic; however, two of the 21 had visited only parts of northern Mexico where malaria transmission has not been reported. Of the 24 total patients, 10 (including cases 1–3) were infected with *P. vivax*; three of the 10 were treated with chloroquine only and had not received primaquine to prevent a relapse infection.

The Harris County Mosquito Control District identified adult female *Anopheles quadrimaculatus*, a competent vector of malaria, in mosquito traps placed near the residences of patients 1 and 2 on August 4. Although possible breeding sites were identified near these residences, mosquito larvae were not found. Rainfall was below average during July–August, and many potential breeding sites were dry.

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Malaria — Continued

Div of Field Epidemiology, Epidemiology Program Office; Div of Parasitic Diseases, National Center for Infectious Diseases, CDC.

Editorial Note: The findings of the Houston investigation indicate that the *P. vivax* infections for patients 1–3 most likely were acquired locally (in Houston) as the result of mosquitoborne transmission. The course of illness in case 3 strongly supports mosquitoborne transmission and possible secondary transmission. Airport malaria (i.e., inadvertent transportation of infective anophelines on airplanes) is unlikely.

This cluster of patients with locally acquired *P. vivax* malaria in an urban setting occurred 1 year after identification of an outbreak of locally acquired *P. falciparum* infection in New York City (M. Layton, New York City Department of Health, personal communication, 1994). Local transmission in densely populated areas represents a change in the epidemiologic pattern of malaria: until 1991, when local transmission was reported in a suburban area of New Jersey (*2–4*), local transmission had occurred predominantly in rural areas.

Although malaria is a notifiable disease in all states, only seven (29%) of the 24 cases identified in this investigation had been reported to the health department in Houston. The lack of reporting of and information about these cases delayed the investigation and efforts to identify other possible locally acquired cases. For example, the two cases in persons who had traveled only to northern Mexico may have been either imported or locally acquired; however, because they had not been reported, they were not investigated promptly. In addition, although most hospital laboratories have the capacity to conduct malaria smear examinations, limitations in the experience of staff may decrease the likelihood of detection.

To improve surveillance of all notifiable conditions, the Texas Department of Health has begun an educational campaign and is implementing an enhanced toll-free telephone reporting system aimed at all health-care practitioners; in addition, the Houston Health Department has distributed newsletters to physicians and infection-control practitioners informing them of the locally acquired cases, the proper treatment for cases, and the importance of reporting. The Harris County Mosquito Control District will enhance vector surveillance for anopheline vectors, which will be linked to active malaria case detection this summer.

Malaria continues to be a leading cause of morbidity and mortality worldwide, particularly because of the development of drug-resistant strains, and is a continuing concern in the United States because of increased international migration, travel, and commerce. The basic requirements for local transmission of malaria—including persons (who may or may not be ill) with malarial gametocytes in their blood (as was documented in Houston), competent vectors, and conducive weather conditions—exist in many areas of the United States. Important strategies for preventing the re-establishment of malaria as an endemic disease in the United States are prompt recognition and reporting of cases of malaria; appropriate treatment of all malaria cases, including primaquine for *P. vivax* and *P. ovale* infections to prevent relapse; and implementation of appropriate control measures.

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Rates of Cesarean Delivery — United States, 1993

The rate of cesarean delivery in the United States is among the highest for developed nations (*1*). Because increased risks for maternal death and morbidity and perinatal morbidity are associated with cesarean delivery, a national health objective for the year 2000 is to reduce the overall rate of cesarean delivery to ≤15.0 per 100 deliveries (1987 baseline: 24.4 per 100 deliveries) (objective 14.8) (*2*)—a level last observed in 1978 (*3*). This report uses data from CDC's National Hospital Discharge Survey (NHDS) to characterize cesarean deliveries during 1993, compares these rates with rates for 1970–1992, and assesses progress toward the national health objective for the year 2000.

Since 1965, NHDS has collected data annually on discharges from short-stay, nonfederal hospitals. For 1993, medical and demographic information were abstracted from a sample of 235,411 inpatients discharged from the 466 participating hospitals. In this analysis, data about the number of cesareans and vaginal births after a previous cesarean (VBAC) are based on weighted national estimates from the NHDS sample of approximately 27,000 (11.5%) women discharged after delivery. The estimated numbers of live births by type of delivery were calculated by applying cesarean rates from the NHDS to the number of live births from national vital registration data. Stated differences in this report are significant at the 95% confidence level.

In 1993, of the estimated 4,039,000 live births, approximately 585,000 (14.5%) were primary cesareans, 336,000 (8.3%) repeat cesareans, 115,000 (2.9%) VBACs, and 3,003,000 (74.4%) other vaginal deliveries. The overall rate of cesarean delivery in 1993 was 22.8 per 100 deliveries, the lowest rate since 1985 but approximately four times the rate in 1970 (5.5) (Table 1). The primary cesarean rate (i.e., number of first cesareans per 100 deliveries to women who had no previous cesarean) for 1993 (16.3) also was the lowest rate since 1985 but approximately four times the rate in 1970 (4.2). Declines in the overall and primary cesarean delivery rates from the mid-1980s to 1993 were not statistically significant. In 1993, of the women who had a previous cesarean birth, approximately one fourth gave birth vaginally (VBAC rate: 25.4); the VBAC rate in 1993 more than doubled from 1988 (12.6).

In 1993, the overall rate of cesarean delivery differed by region, maternal age, hospital size and ownership, and expected source of payment (Table 2). Rates were higher in the South*, for mothers aged ≥30 years (especially those aged ≥35 years), for hospitals containing <100 beds, for proprietary hospitals, and for mothers with Blue Cross/Blue Shield† or other private insurance.

The rate of cesarean delivery varied by the complications of pregnancy or delivery that preceded the cesarean. Rates were highest for women who had fetopelvic disproportion (98.5 per 100 deliveries) or failed induction of labor (94.3). Common medical

*South=Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia

†Use of trade names and commercial sources is for identification only and does not imply endorsement by the Public Health Service or the U.S. Department of Health and Human Services.

TABLE 1. Number of live births; estimated rate of cesarean deliveries, by type; estimated number and percentage of cesarean deliveries, by type; and estimated number and rate of vaginal births after a previous cesarean delivery, by year — United States, selected years, 1970–1993

Year	No. live births[§]	Cesarean rate		Cesarean deliveries*				Vaginal birth after a previous cesarean	
					Repeat[†]				
		Primary[¶]	Overall**	No. primary[§]	No.[§]	(%)	Total[§]	No.[§]	Rate[††]
1993	4039[§§]	16.3	22.8	585	336	(36.5)	921	115	25.4
1992	4084	16.8	23.6	605	359	(37.2)	964	119	25.1
1991	4111	17.1	23.5	628	338	(35.0)	966	108	24.2
1990	4158	16.8	23.5	626	351	(35.9)	977	90	20.4
1989	4041	17.1	23.8	620	342	(35.6)	962	78	18.5
1988	3910	17.5	24.7	615	351	(36.3)	966	50	12.6
1987	3809	17.4	24.4	601	328	(35.3)	929	36	9.8
1986	3757	17.4	24.1	595	310	(34.3)	905	29	8.5
1985	3761	16.3	22.7	559	295	(34.6)	854	21	6.6
1980	3612	12.1	16.5	418	178	(29.9)	596	6[¶¶]	3.4[¶¶]
1975	3144	7.8	10.4	238	89	(27.1)	327	2[¶¶]	2.0[¶¶]
1970	3731	4.2	5.5	153	52	(25.2)	205	1[¶¶]	2.2[¶¶]

*Estimated by applying cesarean rates derived from the National Hospital Discharge Survey to the number of live births from national vital registration data.

†Proportion of all cesareans that are repeat cesareans; standard error does not exceed 1.8% for any year.

§In thousands.

¶Number of first cesareans per 100 deliveries to women who had no previous cesarean delivery; standard error does not exceed 1.1% for any year.

**Number of cesarean deliveries per 100 deliveries; standard error does not exceed 1.5% for any year.

††Number of women who had a vaginal birth after a previous cesarean delivery per 100 deliveries to women who had a previous cesarean delivery; standard error does not exceed 1.3% for any year.

§§Provisional data.

¶¶Number does not meet standards of reliability or precision because the weighted numerator is <10,000 deliveries.

Cesarean Delivery — Continued

complications were breech presentation (rate: 87.1); history of previous cesarean (74.6); antepartum hemorrhage, abruptio placenta, and placenta previa (64.1); obstructed labor (63.5); and multiple gestation (57.8). In 1993, of all women who had a cesarean, 36.5% had a previous cesarean delivery, 17.4% had an abnormal labor, and 17.0% had fetopelvic disproportion. Of all women who delivered, 11.2% had a previous cesarean, 8.7% each had abnormal labor or uterine inertia, and 7.6% were anemic.

TABLE 2. Estimated overall and primary cesarean rates,* by region, age of mother, hospital size and ownership, and expected source of payment — United States, 1993

	Estimated overall cesarean		Estimated primary cesarean	
Category	**Rate**	**(SE†)**	**Rate**	**(SE)**
Region§				
Northeast	23.4	(0.9)	17.4	(0.8)
Midwest	20.8	(1.1)	14.4	(1.1)
South	25.9	(0.9)	18.6	(0.8)
West	19.3	(1.6)	13.7	(1.5)
Age (yrs) of mother				
<20	15.6	(0.8)	14.0	(0.8)
20–24	19.9	(0.6)	15.1	(0.6)
25–29	23.0	(0.6)	16.1	(0.6)
30–34	26.3	(0.7)	17.1	(0.7)
≥35	30.3	(1.1)	21.9	(1.1)
Hospital size (no. beds)				
<100	25.4	(1.0)	17.9	(0.9)
100–299	21.9	(0.6)	15.5	(0.6)
300–499	22.6	(0.9)	16.2	(0.8)
≥500	22.2	(1.3)	16.9	(1.2)
Hospital ownership				
Nonprofit	22.0	(0.5)	15.8	(0.5)
State and local government	20.5	(1.1)	14.0	(1.1)
Proprietary	29.0	(1.2)	20.7	(1.1)
Expected source of payment				
Blue Cross/Blue Shield¶	26.7	(3.2)	18.6	(0.7)
Other private insurance	25.7	(1.6)	18.7	(0.8)
Medicaid	19.5	(1.0)	13.8	(0.9)
Other government sources	24.5	(4.0)	16.8	(0.6)
Self	16.1	(2.4)	12.1	(0.8)
Other	21.9	(3.1)	14.4	(0.8)
Total	**22.8**	**(0.4)**	**16.3**	**(0.4)**

*Overall=number of cesarean deliveries per 100 deliveries; primary=number of first cesareans per 100 deliveries to women who did not have a previous cesarean.

†Standard error.

§Northeast=Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont; Midwest=Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin, and Wyoming; South=Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia; and West=Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, and Washington.

¶Use of trade names and commercial sources is for identification only and does not imply endorsement by the Public Health Service or the U.S. Department of Health and Human Services.

Cesarean Delivery — Continued

Reported by: Natality, Marriage, and Divorce Statistics Br, Div of Vital Statistics, National Center for Health Statistics, CDC.

Editorial Note: The findings in this report indicate that the overall and primary cesarean rates have remained relatively stable since the mid-1980s. Although the VBAC rate increased twofold during 1988–1993, the anticipated reduction in the overall rate of cesarean delivery was offset by trends among women giving birth that are associated with higher risk for cesarean delivery (i.e., increases in maternal age at birth and in first order and plural births [*4*]). In particular, maternal age is an independent risk factor for cesarean delivery even after adjustments for other potential confounding factors (e.g., race, education, and complications of labor and delivery) (*5*).

In this study, rates of cesarean delivery were analyzed separately by region, hospital size and ownership, and expected source of payment; therefore, simultaneous effects of the other variables could not be analyzed. For example, the study could not assess whether the higher rates of cesarean delivery in small hospitals (i.e., <100 beds) reflected the increased likelihood of proprietary ownership of these hospitals.

The overall cesarean delivery rate is directly associated with the primary cesarean rate and the VBAC rate. Therefore, in addition to establishing year 2000 national health objective 14.8 to assist in monitoring trends in the overall cesarean delivery rate, two more specific objectives were established to monitor trends in primary cesarean and VBAC rates. The objectives are to reduce the primary cesarean delivery rate to ≤12.0 per 100 deliveries (1987 baseline: 17.4 per 100 deliveries) (objective 14.8a) and to increase the number of VBACs to ≥35.0 per 100 women who had a previous cesarean (objective 14.8b) (*2*). If the VBAC rate continues to increase at the rate observed during 1988–1993, the national health objective may be met by the year 2000; however, the most recent data indicate the rate stabilized during 1991–1993. Even with a VBAC rate of 35.0, the primary rate must decline by nearly half (to 8.4) to achieve the year 2000 target rate for overall cesarean deliveries (15.0). Based on the stability of the primary cesarean delivery rates during 1985–1993, the overall cesarean rate probably will not decline to meet the objective by the year 2000.

In many countries with demographic profiles similar to the United States, cesarean rates are ≤15.0 per 100 deliveries (*1*). Strategies to achieve this rate in the United States will require the widespread use of four obstetrical practices that have been successful in reducing cesarean delivery rates in many hospitals: 1) active management of labor; 2) public dissemination of physician-specific cesarean delivery rates to increase public awareness of differences in practices; 3) implementation of standardized protocols for repeat cesareans, dystocia, and fetal distress; and 4) establishment of reduction of the rate as an institutional priority (*6–8*).

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National Notifiable Diseases Reporting — United States, 1995

Beginning with the April 28, 1995, MMWR, the following modifications will be incorporated in Tables I and II, Cases of Notifiable Diseases, United States, and Figure I, Notifiable Disease Reports: 1) diseases recently deleted from the nationally notifiable diseases list by the Council of State and Territorial Epidemiologists will no longer appear in Tables I and II and Figure I (i.e., aseptic meningitis, primary and postinfectious encephalitis, unspecified hepatitis, leptospirosis, and tularemia) and 2) the column in Table II labeled NA,NB hepatitis will be relabeled "C/NA,NB" hepatitis.

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